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10/777,378	02/13/2004	Makoto Sasaki	118626	4597

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EXAMINER	
TYLER, NATHAN K	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/777,378	SASAKI, MAKOTO	
	Examiner	Art Unit	
	Nathan K. Tyler	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *13022004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

3. Claims 13 and 14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 13 defines a "storage medium"

embodying functional descriptive material. Because the claim merely recites that the "storage medium" is "capable of" being read by a computer, the claim does not explicitly define a computer-readable medium or memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The examiner suggests amending the claim to embody the program on "computer-readable medium" or equivalent in order to make the claim statutory. Any amendment to the claim should be commensurate with its corresponding disclosure. An equivalent rejection applies to claim 14.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 and 3-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Sasaki et al. (US 20030072018 A1).

Regarding **claim 1**, Sasaki discloses a numerical processing apparatus comprising a limited output point group generation unit that generates a limited output point group in the output space corresponding to a limited input point group satisfying a predetermined constraint condition set in the input space in advance (Fig. 7 shows the L*a*b* space (output space). This space is constrained to T: "color area satisfying coverage limitation" "A condition of a coverage limitation is imposed to a general output device. The coverage limitation implies that an upper limit is set to the total amount of a recording material such as a toner or an ink, which is used for reproducing a color signal" at paragraph 9. This coverage limitation is a predetermined constraint condition set in the CMYK (input) space, as the CMYK space is used by the printer); and an input point element determination unit (Fig. 1, numeral 15 "optimum india ink amount determining section) that determines at least one element of the input point satisfying the constraint condition, when an output point is given, on the basis of the limited input point group and the generated limited output point group ("The YMCK signal calculating section 16 predicts YMC by using the L*a*b* input to the optimum black colorant amount determining section 15 and the optimum black colorant amount calculated by the optimum black colorant amount determining section 15, and determines YMCK (input) by the predicted YMC and the optimum black colorant amount... Thus, the YMCK (input space) corresponding to the input L*a*b* (output space) can be determined." at paragraph [0040]).

Regarding **claim 3**, Sasaki discloses that the input point element determination unit determines at least one of n elements of the input points on the basis of the limited output point group and a group of elements to be determined in the limited input point group corresponding to the limited output point group ("The YMCK signal calculating section 16 predicts YMC by using the L*a*b* input to the optimum black colorant amount determining section 15 and the optimum black colorant amount calculated by the optimum black colorant amount determining section 15, and determines YMCK (input) by the predicted YMC and the optimum black colorant amount... Thus, the YMCK (input space) corresponding to the input L*a*b* (output space) can be determined." at paragraph [0040]).

Regarding **claim 4**, Sasaki discloses an input point determination unit that determines the residual elements of the input points on the basis of the given output point and at least one element of the input points determined by the input point element determination unit (Fig. 1, numeral 16 "YMCK signal calculating section." "In consideration of the foregoing, a maximum black colorant amount corresponding to L*a*b* subjected to the dichotomizing search is calculated, and the YMC is predicted from the maximum black colorant amount and the L*a*b*." at paragraph [0050]).

Regarding **claim 5**, Sasaki discloses a color processing apparatus comprising a limited output color group generation unit that generates a limited output color group in the output color space corresponding to a limited input color group satisfying a predetermined constraint condition set in the input color space in advance (Fig. 7 shows the L*a*b* space (output space).

This space is constrained to T: "color area satisfying coverage limitation" "A condition of a coverage limitation is imposed to a general output device. The coverage limitation implies that an upper limit is set to the total amount of a recording material such as a toner or an ink, which is used for reproducing a color signal" at paragraph 9. This coverage limitation is a predetermined constraint condition set in the CMYK (input) space, as the CMYK space is used by the printer); and an input color element determination unit that determines at least one element of the input color satisfying the constraint condition, when an output color is given, on the basis the limited input color group and the generated limited output color group ("The YMCK signal calculating section 16 predicts YMC by using the L*a*b* input to the optimum black colorant amount determining section 15 and the optimum black colorant amount calculated by the optimum black colorant amount determining section 15, and determines YMCK (input) by the predicted YMC and the optimum black colorant amount... Thus, the YMCK (input space) corresponding to the input L*a*b* (output space) can be determined." at paragraph [0040]).

Regarding **claim 6**, Sasaki discloses that the input color space includes an element of black (see grounds for rejection for claim 5, the input space is CMYK, where K is black); and the constraint condition includes a condition of the input colors in which the output colors corresponding to the input colors are distributed on a curved surface corresponding to a value of black (see Fig. 3(B). Colors along the chrominance axis (axis of ordinate) are mapped along the curved line representing the amount of black. "the relationship between C* and the black colorant amount shown in a solid line of FIG. 3(B) [is] predicted by color prediction modeling based on the regulated black colorant amount shown in the black circle of FIG. 3. Data to be

used for the modeling are the typical color signal (L*a*b*) in the color gamut..." at paragraph [0037]), which is the element of the input colors.

Regarding **claim 7**, Sasaki discloses that the input color space includes four elements of cyan, magenta, yellow and black (see grounds for rejection for claim 5, input space is CMYK); and the constraint condition includes a condition that a sum of cyan, magenta, yellow and black takes a value decided in advance ("If the YMCK ranges from 0% to 100% and the sum of the YMCK is equal to or smaller than a coverage limitation value..." at paragraph [0050]).

Regarding **claim 8**, Sasaki discloses that the input color space includes four elements of cyan, magenta, yellow and black (see above); and the constraint condition includes a condition that at least one of cyan, magenta and yellow takes a maximum value in an allowable range ("If the YMCK ranges from 0% to 100% and the sum of the YMCK is equal to or smaller than a coverage limitation value..." at paragraph [0050]. For the total sum to equal a coverage limitation value, each of cyan, magenta, and yellow is set to a maximum value where the black colorant value is also maximized, and the total combination equals the coverage limitation value).

Regarding **claim 9**, Sasaki discloses that the input color space includes four elements of cyan, magenta, yellow and black (see above); and the constraint condition includes a condition that at least one of cyan, magenta and yellow takes a minimum value in an allowable range ("In general, a total color material amount is minimized in a combination of YMCK to which the black colorant is added at a maximum" at paragraph [0050]. Here K is maximized and each of C, M, and Y are at a minimum).

Regarding **claim 10**, Sasaki discloses that the input color space includes four elements of cyan, magenta, yellow and black (see above), and the color processing apparatus further comprises an input color determination unit that determines the residual elements of the input colors on the basis of the output color and at least one of the elements of cyan, magenta, yellow and black of the input color determined by the input color element determination unit (Fig. 1, numeral 16 "YMCK signal calculating section." "In consideration of the foregoing, a maximum black colorant amount corresponding to L*a*b* subjected to the dichotomizing search is calculated, and the YMC is predicted from the maximum black colorant amount and the L*a*b*." at paragraph [0050]).

Regarding **claim 11**, Sasaki discloses a numerical processing method comprising generating a limited output point group in the output space corresponding to a limited input point group satisfying a predetermined constraint condition set in the input space in advance (see grounds for rejection for claim 1); and determining at least one element of the input point satisfying the constraint condition, when an output point is given, on the basis of the limited input point group and the generated limited output point group (see grounds for rejection for claim 1).

Regarding **claim 12**, Sasaki discloses a color processing method comprising: generating a limited output color group in the output color space corresponding to a limited input color group satisfying a predetermined constraint condition set in the input color space in advance (see grounds for rejection for claim 5); and determining at least one element of the input color satisfying the constraint condition, when an output color is given, on the basis of the limited

input color group and the generated limited output color group (see grounds for rejection for claim 5).

Regarding **claim 13**, Sasaki discloses a storage medium capable of being read by a computer and storing a numerical processing program for making a computer execute a numerical processing ("Each of the embodiments of the color processing method according to the invention can also be implemented by a computer program. In that case, the program and data to be used by the same program can also be stored in a computer readable storage medium" at paragraph [0067]) comprising generating a limited output point group in the output space corresponding to a limited input point group satisfying a predetermined constraint condition set in the input space in advance (see grounds for rejection for claim 1); and determining at least one element of the input point satisfying the constraint condition, when an output point is given, on the basis of the limited input point group and the generated limited output point group (see grounds for rejection for claim 1).

Regarding **claim 14**, Sasaki discloses a storage medium capable of being read by a computer and storing a color processing program for making a computer execute a color processing ("Each of the embodiments of the color processing method according to the invention can also be implemented by a computer program. In that case, the program and data to be used by the same program can also be stored in a computer readable storage medium" at paragraph [0067]) comprising generating a limited output color group in the output color space corresponding to a limited input color group satisfying a predetermined constraint condition set in the input color space in advance (see grounds for rejection for claim 5); and determining at least one element of the input color satisfying the constraint condition, when an output color is

given, on the basis of the limited input color group and the generated limited output color group (see grounds for rejection for claim 5).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Sasaki and Kumada et al. (US 6919972 B2).

Regarding **claim 2**, Sasaki teaches a numerical conversion apparatus that applies a constraint condition to the input space, generating limited input and output point groups based on this constraint, and then performing a conversion from the output space to the input space using these limited point groups. Sasaki does not explicitly teach the correspondence from output points to input points being decided uniquely. Kumada teaches mapping each point in LAB space to a unique point in CMYK space in a color conversion process (Kumada Fig. 13 shows a graph used to generate a LAB to CMYK conversion table. In the graph, the mapping function is shown to be a one-to-one function, where each LAB value is mapped to a unique CMYK value).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to use the graph disclosed by Kumada to generate the look up table used for color space

conversion in the numerical processing apparatus disclosed by Sasaki, since the one-to-one function of the conversion graph could be used in combination with the numerical processing apparatus to achieve the predictable result of generating a unique point in the input space for each point in the output space.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan K. Tyler whose telephone number is 571-270-1584. The examiner can normally be reached on M-F 7:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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